

Positive Effects of Chemical Fertilizer, Pesticides and other Modern Practices of Agriculture

- ④ High yield / high and fast returns / profit oriented
- ④ Increased mechanization
- ④ Scope for intensive cropping
- ④ New varieties of crop plants (pest/disease tolerant)
- ④ Maximum utilization of land and water
- ④ Meeting the need of sufficient and fast food production
- ④ Immediate and direct supply of nutrients to the plant through chemical fertilizer (NPK).
- ④ Better pest, disease and weed control
- ④ Package of practices for different locations, situations, crops, agro climatic regions

Negative Effects of Chemical Fertilizer, Pesticides and other Modern Practices of Agriculture

- ④ Short term benefit, operates law of diminishing returns
- ④ Depletion of nutrient base of the soil, water and atmosphere quality
- ④ Environmental(water,soil and air)pollution due to use of chemicals
- ④ Health hazards due to entry of pesticides, toxins, antibiotics, heavy metals in to food chain
- ④ High cost of production
- ④ Increasing dependency on external inputs
- ④ Less diversification manifested through disappearance of genetic races because of monoculture leading to risks such as loss of biodiversity, pest and disease resistance and resurgence.
- ④ Poor quality of produce
- ④ Economic disparity in the society widens
- ④ Operates against principles of nature and ecology
- ④ Natural parasites, predators and beneficial insects are adversely affected and totally disappear over a period of time.

Definition of sustainable agriculture

Sustainable agriculture is a system of agriculture that is committed to maintain and preserve the natural resource base of soil, water and atmosphere ensuring future generations the capacity to feed them with an adequate supply of safe and wholesome food (Gracet, 1990).

Sustainable agriculture recommends a range of practices, which addresses many problems that arise due to the problems of modern agriculture such as loss of soil productivity, impacts of agricultural pollution, decreased income due to high production costs, and minimal or uneconomic returns.

Positive Effects of Sustainable Agriculture

1. Affordability by any farmer
2. No sophisticated/imported and special technology is necessary
3. Environmental conservation and protection
4. Healthy atmosphere/healthy food
5. Prevent / avoid ecological degradation.
6. Prevent/avoid ecological degradation
7. Security more through higher levels of disease and pest resistance
8. Sustain soil fertility through organic recycling
9. Greater Bio-diversity
10. Efficient use of natural resources
11. Self sustaining

Negative Effects of Sustainable Agriculture

1. Takes longer time to realize the benefits of regenerative farming
2. The change is gradual
3. Relatively difficult to motivate farmers for change initially; once convinced, the adoption is easy.
4. Comparatively labour intensive
5. Needs proper planning for allocation/use of available resources
6. Initial yield is low

Criteria of Sustainable Agriculture

1. Inter relatedness of all the farming systems such as cropping systems, animal husbandry, fisheries, forestry, sericulture, poultry etc. including the farmer and the family
2. Need to maximize desired biological relationships in the system and minimize the use of materials and practices that disrupt these relations.
3. Application of prior experience and latest scientific advances to create integrated, resource conserving, equitable farming systems.
4. Reduce environmental degradation, maintain agricultural productivity, promote economic viability in both short and long term, and maintain stable rural communities and quality of life.
5. No overburden on natural resource base and its carrying capacity.

Elements of Sustainability in Agriculture/Sustainable Agriculture

Sustainable Agriculture consists of elements, which are common in many regions. The methods to improve their sustainability may vary from one agro ecological region to another. However there are some common sets of practices among farmers trying to take a more sustainable approach by use of on farm or local resources. However each of them contributes to a grater extent to realize long term farm profitability, environmental stewardship and quality of life.

1. Soil Conservation: Soil conversation methods including contour cultivation, contour bunding, graded bunding, vegetative barriers, strip cropping, cover cropping, reduced tillage etc. help prevent loss of soil due to wind and water erosion.
2. Crop diversity: Increased crop diversity on farm can help reduce risks from extremes in weather, marketing conditions, pest and disease incidences. The increased diversity of crop and other plants such as trees, shrubs and pastures also contribute to soil conservation, habitat protection and increase populations of beneficial insects.
3. Nutrient management: Integrated management of essential nutrients can improve and sustain soil fertility and protect environment. Increased use of on farm (low cost) inputs such as organic manures, compost, green manures and crop residues not only reduces cost of production but also rejuvenates soil health.
4. Pest management: It is a sustainable approach to manage pests by integrating the available plant protection methods like cultural, physical, mechanical, biological and chemical methods, which optimizes the production costs, besides maintaining environmental balance.
5. Water quality & water conservation: Practices like zero tillage, deep ploughing, mulching and micro irrigation techniques help to optimize the water consumption or requirement besides conserving and augmenting the soil moisture on long term basis. It is also helpful in protecting the quality of drinking water and surface water.
6. Agro forestry: A combination of silvi-pastoral, agri-Silvi-pastoral, agrihorticulture, horti-silvi pastoral, alley cropping, ley farming help conserve soil and water, and profitability. Also lead to supply of fuel wood, horticultural products and achieve balanced nutrition to rural people.
7. Marketing: Improved marketing facilities can ensure remunerative and sustainable return to farmers. Direct marketing of produce can exclude intermediaries and ensure higher returns.